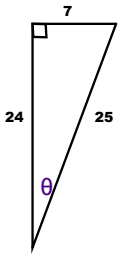
[redacted]

Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

Ticket in: Find the values of the six trigonometric functions of angle θ.

Round your answer to the nearest thousandth.



1) sin θ
2) cos θ
3) tan θ
4) cot θ
5) sec θ
6) csc θ

[redacted]

Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

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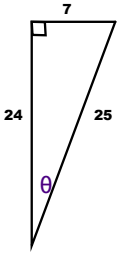

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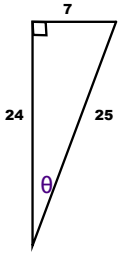

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3

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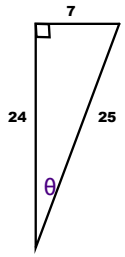

1) sin θ **4) cot θ**
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3) tan θ **6) csc θ**

[redacted]

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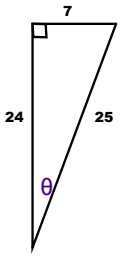

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Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

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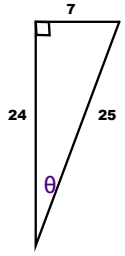
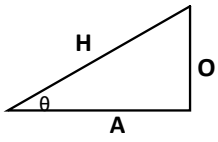


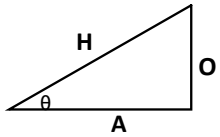
1) sin θ **4) cot θ**
2) cos θ **5) sec θ**
3) tan θ **6) csc θ**

[redacted]



There are three FUNDAMENTAL IDENTITIES for trig functions.

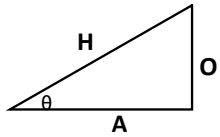
- Reciprocal Identities
- Quotient Identities
- Pythagorean Identities



There are three FUNDAMENTAL IDENTITIES for trig functions.

Review:
Reciprocal Identities

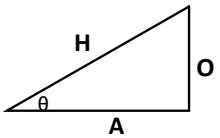
$$\csc\theta = \frac{1}{?}$$



There are three FUNDAMENTAL IDENTITIES for trig functions.

Review:
Quotient Identities

$$\tan\theta = \frac{?}{?}$$



There are three FUNDAMENTAL IDENTITIES for trig functions.

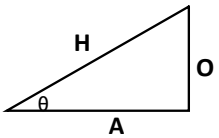
New One!
Pythagorean Identities

The Pythagorean Theorem states that $a^2 + b^2 = c^2$

Using the triangle above...
$(\text{Opposite})^2 + (\text{Adjacent})^2 = (\text{Hypotenuse})^2$

Divide both sides by $(\text{Hypotenuse})^2$

$$\left(\frac{\text{Opposite}^2}{\text{Hypotenuse}^2}\right)+\left(\frac{\text{Adjacent}^2}{\text{Hypotenuse}^2}\right)=1$$



There are three FUNDAMENTAL IDENTITIES for trig functions.

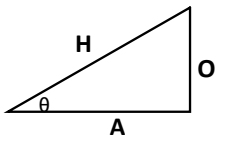
Pythagorean Identities

$$\left(\frac{\text{Opposite}^2}{\text{Hypotenuse}^2}\right)+\left(\frac{\text{Adjacent}^2}{\text{Hypotenuse}^2}\right)=1$$

$$\left(\frac{\text{Opposite}}{\text{Hypotenuse}}\right)^2+\left(\frac{\text{Adjacent}}{\text{Hypotenuse}}\right)^2=1$$

$$(\sin\theta)^2+(\cos\theta)^2=1$$

The most important of the Pythagorean Identities!

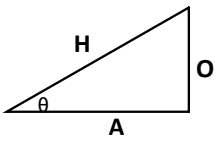


There are three FUNDAMENTAL IDENTITIES for trig functions.

Pythagorean Identities

Use this Pythagorean Identity to prove another Pythagorean Identity: $(\sin\theta)^2 + (\cos\theta)^2 = 1$

$\tan^2 \theta + 1 = \sec^2 \theta$

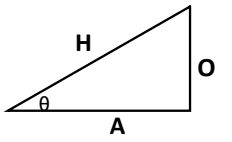


There are three FUNDAMENTAL IDENTITIES for trig functions.

Pythagorean Identities

Use this Pythagorean Identity to prove another Pythagorean Identity: $(\sin\theta)^2 + (\cos\theta)^2 = 1$

$\cot^2 \theta + 1 = \csc^2 \theta$



There are three FUNDAMENTAL IDENTITIES for trig functions.

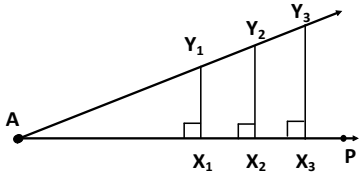
See how many of the Fundamental Identities you can remember!

Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

Activity: **Exploring Trigonometric Functions**

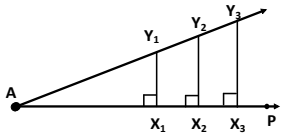
- **You will need: a protractor, a ruler and a calculator.**

- **On a sheet of paper, make a large diagram like the one shown below. Place segments $\overline{X_1Y_1}$, $\overline{X_2Y_2}$, $\overline{X_3Y_3}$, wherever you wish, as long as they are perpendicular to $\overrightarrow{AP}$**



Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

Copy and complete the table by measuring the indicated sides and calculating sin A, cos A, and tan A

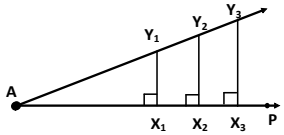


	opp. $\angle A$	adj. $\angle A$	hyp.	$\sin A = \frac{\text{opp.}}{\text{hyp.}}$	$\cos A = \frac{\text{adj.}}{\text{hyp.}}$	$\tan A = \frac{\text{opp.}}{\text{adj.}}$
$\triangle AY_1X_1$						
$\triangle AY_2X_2$						
$\triangle AY_3X_3$						

What do you notice?

Make a conjecture about the sine, cosine and tangent functions for the measure of angle A.

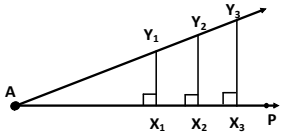
Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems



What do you notice?

The ratios for the sine, cosine, and tangent of an acute angle in similar triangles DOES NOT depend on the lengths of the sides.

Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems



Think about it!

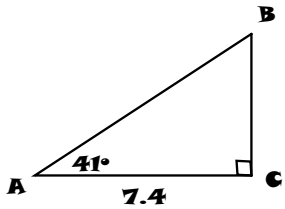
Angle A is about 20°. What would happen if Angle A was about 45°?

The trigonometric functions depend only on the measure of the acute angle.

Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

How does this help us?

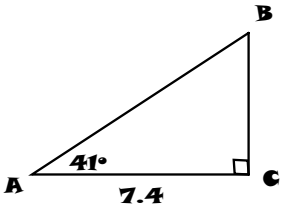
For Triangle ABC, find the length of side AB to the nearest thousandth.



Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

How does this help us?

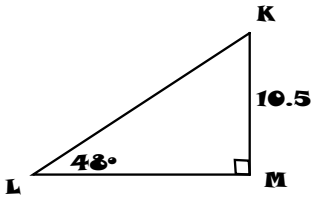
For Triangle ABC, find the length of side BC
to the nearest thousandth.



[redacted]

Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

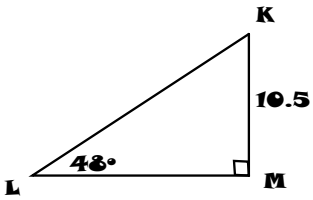
For Triangle KLM, find the length of side KL
to the nearest thousandth.



[redacted]

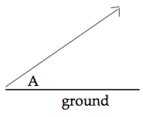
Obj: Students will utilize the fundamental identities of trig functions to solve real-world problems

For Triangle KLM, find the length of side LM
to the nearest thousandth.

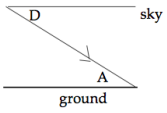


[redacted]

We often measure an angle from the ground upward (an angle of elevation), or downward from an imaginary horizontal line (an angle of depression). By alternate interior angles, an angle of depression will be congruent to an angle of elevation.



An Angle of Elevation A



An Angle of Depression D
Then D ≅ A

A 15 foot ladder leans against a wall with an angle of elevation of 60°.

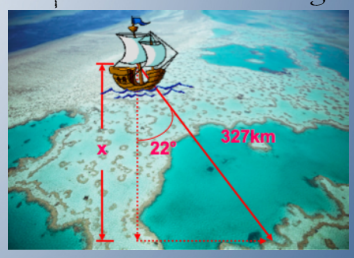
How far up the wall does the ladder reach?

How far from the wall is the base of the ladder?

Enter the larger of the two answers.

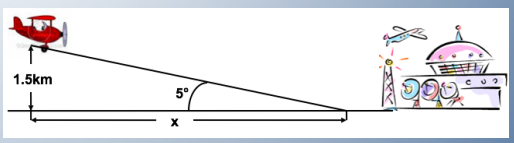
[redacted]

A ship sailed from a port with a bearing of S 22°E. How far south has the ship traveled after covering a distance of 327km?



[redacted]

A plane is flying at an altitude of 1.5km. The pilot wants to descend into an airport so that the path of the plane makes an angle of 5° with the ground. How far from the airport (horizontal distance) should the descent begin?



[redacted]

Homework:

- **Re-do example #3 on page 331.**
- **Do page 332 - 333 (1, 4-6, 20-31)**